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| **Mr. Jeremy's Kingdom** | **Mr. Jeremy's Cell** |
| http://www.aaronsklar.com/aaronsklar/scienceclasses/sci10/Biology/CellAnalogyCas.jpg | http://www.aaronsklar.com/aaronsklar/scienceclasses/sci10/Biology/CellAnalogyCell.jpg |
| **The wall around the city is like the cell membrane.** The wall controls movement of people and items coming in and out of the city through the various ports of entry that are controlled by immigration. The cell membrane controls movement of items in and out of the cell through various pores | |
| **The castle is like the cell's nucleus.** The castle is the control center of the city, it regulates all activity in the city. The nucleus is the control center of the cell regulating all cell activity. | |
| **The castle wall is like the nuclear membrane.** The castle wall controls movement in and out of the castle through guarded entrances. The nuclear membrane controls the movement of substances in and out of the nucleus through pores. | |
| **The king is like the cell's chromosomes.** The king is found in the castle, he directs all activities in the city including expansion and creation of another kingdom should the city grow too large. Chromosomes are found in the nucleus and directs all activities of the cell including growth and reproduction. | |
| **The city roads are like the endoplasmic reticulum.**Roads are the transport system which allows materials to be carried throughout the city. The ER is a transport system that carries materials throughout the cell. | |
| **The machine shops are like the cell's ribosomes.** The machine shops are built along the roads, here they create materials to build the city, instruction is received at the tech school located in the castle. Ribosomes are attached to the ER, they are protein factories that create the cells building materials. They receive instruction from the nucleolus in the nucleus. | |
| **The windmill is like the cell's chloroplast.** The windmill transforms the raw energy of wind into productive energy for the city like the chloroplast transforms the raw energy of the sun into productive energy for the cell. | |
| **The Garden is like the Cell's Mitochondria.** The Garden takes manure and seeds that have been brought into the city and transforms them into food that provides energy for the people and horses. The mitochondria produces ATP which is food for the cell allowing it to function. | |
| **The grocer and lagoon in the city act like a cell's vacuole.**The grocer stores the food for the city and the lagoon is where the city waste is stored. The vacuole stores both the cells waste and food. | |
| **The horse drawn wagons are like the cell's lysosomes.**The wagons travel around the city collecting peoples garbage and fixing up what needs to be repaired. The lysosomes move around the cell cleaning up and doing cell maintenance. | |

**Mr. Jeremy’s Grade:**

**Design: 3/5**

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| **0** | **1** | **2** | **3** | **4** | **5** |
| did not hand in | incomplete | below average | average | above average | extraordinary |

*Mr. Jeremy's model obviously took some time and thought to complete, but it was not extraordinary. If he built a physical model of his “Cell Kingdom” he could have received a 5.*

**Information in the model: 18/22**

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| **cell wall not included** | **cell membrane 2/2** | **nucleus 2/2** | **nuclear membrane 2/2** |
| **chromosomes 2/2** | **cytoplasm not included** | **ribosomes 2/2** | **vacuole 2/2** |
| **mitochondria 2/2** | **ER 1/2** | **chloroplast 1/2** | **lysosomes 2/2** |

*Because Mr. Jeremy covered 10 out of the 11 required organelles and received 18 marks. He received  
one point off for chloroplast since the windmill utilizes an outside source (wind) to drive  
its process just like the chloroplast uses the outside source of light to drive it's process. But,  
unlike the cytoplasm, the windmill does not supply energy to the entire cell. The ER also received a point off since it partially acts like a roadway, but unlike a roadway, the ER also does the transportation  
within the cell. A roadway allows for transportation, but does not do the transporting.*